EXPERIMENT NO. 3

TITLE: Electronic Modelling & Simulation of an Arithmetic circuit/Combination circuit/Switching circuit/Data Selector circuit

AIM:

1. To model, design and simulate an arithmetic or combination circuit like adder using Multisim simulation software/tool.
2. To model, design and simulate a switching or data selector circuit like multiplexer using Multisim simulation software/tool.
3. To verify the output using truth table.

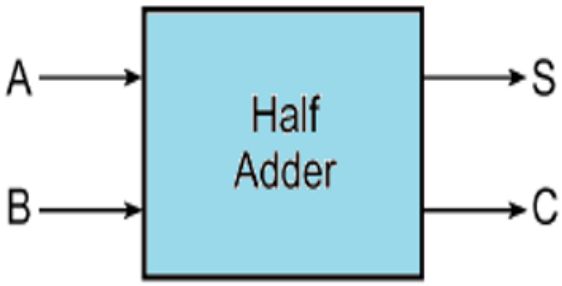
APPARATUS: Multisim software, AND gate, EX-OR gate, Switches, Indicators etc.

THEORY:

ARITHMATIC/COMBINATION CIRCUIT:

Half adder is a combinational circuit which is used for the addition of two inputs. It has two inputs A & B and two outputs sum and carry.

BLOCK DIAGRAM:



TRUTH TABLE:

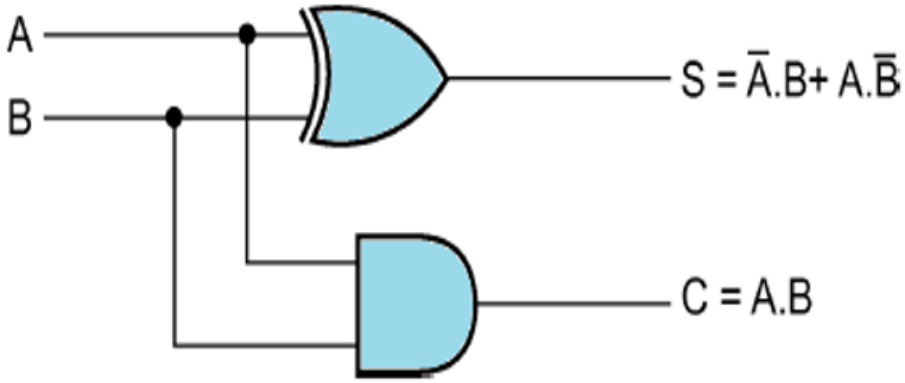
A	B	S	C
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

OUTPUT EQUATION:

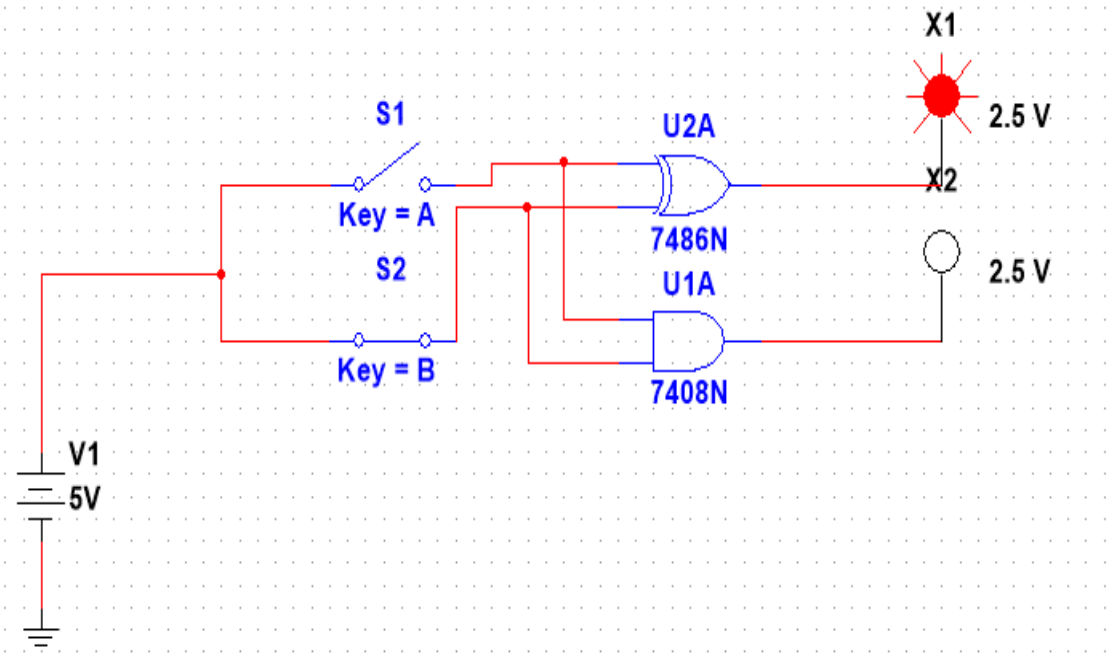
Sum = A'B + AB'

Carry = A.B

IMPLEMENTATION USING LOGIC GATES:



SIMULATION RESULTS:



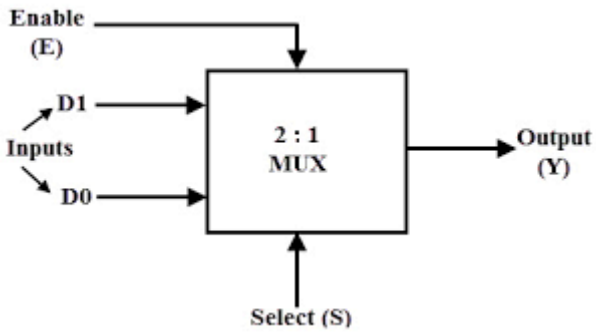
DATA SELECTOR/SWITCHING CIRCUIT:

Multiplexer:

It is a combinational circuit which follows multiplexing property. It is also known as many to 1 convertor. Multiplexing is combining multiple signals and transmitting it on a single channel. Multiplexer is also known as data selector. It selects a single input at a time from the

multiple data input lines and sends it on a single output line. The relationship between number of input lines and selection lines is given by $2^m = n$ where m = no. of selection lines and n = no. of input lines.

BLOCK DIAGRAM:



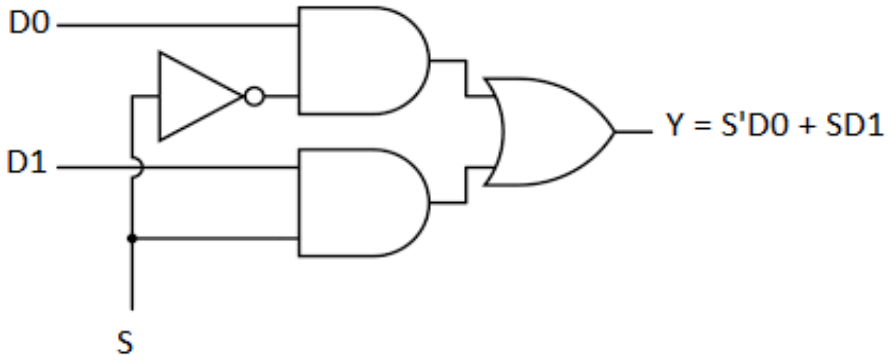
TRUTH TABLE:

Selection Line	Data Inputs		Output
S	D0	D1	Y
0	0	X	0
0	1	X	1
1	X	0	0
1	X	1	1

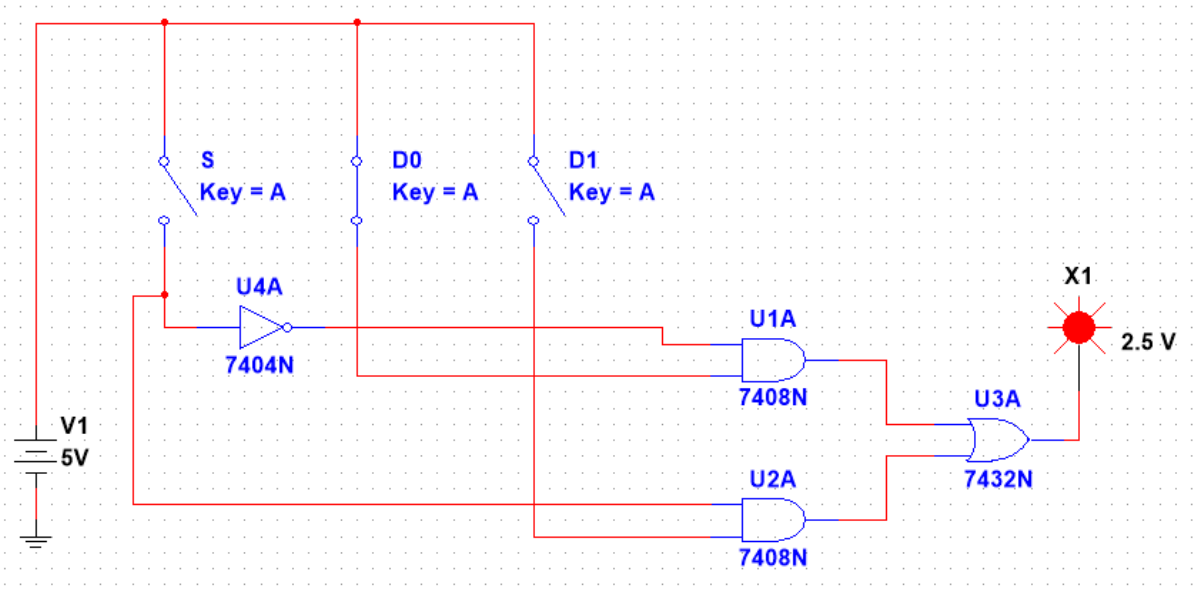
OUTPUT EQUATION:

Y = S'D0 + SD1

CIRCUIT DIAGRAM:



SIMULATION RESULTS:



ASSIGNMENT QUESTION:

Q. To model, design and simulate a full adder circuit. Show the simulation and take printout of the simulation circuit.